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SCIENCE AND INDUSTRY

AUG 13 1954

Among Florida Citrus Leaders



LATT MAXCY

Long prominently identified with the citrus industry in Florida and owner of large acreage of fine citrus groves. At present vice-president and general manager of the Florida Division of Clinton Foods, Inc. Mr. Maxcy was one of the founders of Florida Citrus Mutual and served as its president during the first year of its existence.

This
Month

Citrus Insect Control For August 1954
Effect of Cross Pollination on Fruit Setting In Washington Navel Orange
21st Annual Citrus Growers Institute, Camp McQuarrie, August 16-20
Florida Citrus Budwood Certification Program
Avocado Production On Florida Sands
Citrus In School Lunches Corrects Vitamin C Deficiency

Vol. 35, No. 8

Bartow, Florida

August, 1954

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citrus scalecide

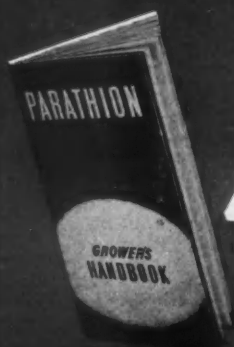
Parathion applied during July and August controls:

RED SCALE
SNOW SCALE
PURPLE SCALE
COTTONY-CUSHION SCALE

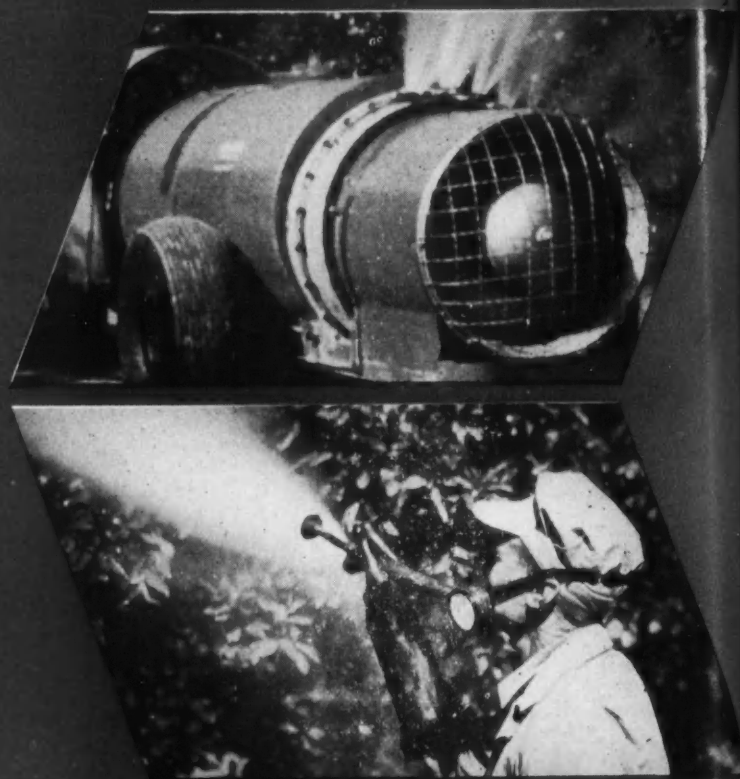
A higher percentage of the young stages of these scale insects will be present during these two months. Control obtained at this time will last longer into the Fall than when treatment is made earlier in the year.

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Brownsville, Florida



R. M. Pratt

Citrus Insect Control



R. B. Johnson

For August
1954

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment
Station, Lake Alfred



W. L. Thompson

Purple scale infestations reached a peak early in July and the general level can be expected to decline through August. The population levels reached in the spring and early summer were the highest in the four years of record, and many groves which have not received a summer scalecide are still heavily infested. An increase in hatching will probably start about the middle of August.

A peak of red scale activity also has been passed. In general this scale has not been a serious problem this season. There may be some increase in activity in late August.

Purple mite activity is declining rapidly and infestation may be expected to continue to decline through August if normally rainy weather continues. Mite infestation may persist in locally dry areas.

In general, the principal problem during August will be rust mite control. The present increasing trend will probably continue through the month. There are no indications, however, that the problem will be as severe as it was last year.

Spray Program

Rust mite will be the chief control problem during August, except where scales were not controlled during June or July. Although scale activity is expected to decrease, it will still be at a high level during August. As a result, groves that did not receive a scalecide in June or July will almost certainly need scale control as well as sulfur for rust mites.

Wettable sulfur is the safest material for rust mite control because it is less likely to burn the fruit and foliage than even sulfur dust. A combination of $\frac{3}{4}$ gallon of lime-sulfur with 5 pounds of wettable sulfur is the most effective spray, but its use is also more likely to

result in a burn. This combination may be used during August, however, with a minimum of danger on grapefruit and late-season oranges. It should not be used on early and mid-season oranges or tangerines, nor should it be used in a concentrate spray on any variety.

There is a tendency among some growers to use more wettable sulfur than necessary. Ten pounds per 100 gallons if used alone or 5 pounds if combined with parathion will give good control of rust mites. Larger amounts are wasteful. No form of sulfur should ever be mixed with oil or applied within 3 weeks of an oil spray.

It may be advantageous to use a sulfur dust where a scalecide was applied during June or July, especially where an oil emulsion was used. Sulfur dusts give good rust mite control but are economical only when properly applied. Proper coverage, a must with any type of application, is difficult to obtain with a dust especially on large trees. Good rust mite control requires from $\frac{1}{2}$ to $1\frac{1}{2}$ pounds of sulfur per tree applied from both sides with a special effort made to cover the tree tops. Dust sticks poorly to dry foliage. The best time to dust is at night or early morning when the trees are moist with dew.

Except where scale infestations are dangerously high or where oil emulsions are to be used, it would be well to delay spraying for scale control until late August or early September when a higher percentage of scales will be in the younger stages. Where scale infestations need immediate attention or where oil emulsion is to be used, spraying should not be delayed.

Oil emulsion has been used for many years and gives good scale control. On the other hand, it has the disadvantage of reducing the soluble solids content of the fruit when applied during August and September. It is therefore not recommended during these months except where

solids are not a factor or where it is impractical to use parathion. If oil emulsion must be used, the application should be made as soon as possible to minimize the effect on solids. Those who use oil during August should also remember that oil does not give good control of rust mites and that if rust mites are not controlled before the oil is applied, they may become very numerous within as short an interval as three weeks after spraying.

Parathion may be used at any time and may be combined with wettable sulfur, but not with lime-sulfur. Use 1 pound of 15 percent parathion per 100 gallons for light infestation of purple and red scale or 1.7 pounds for heavy infestations, and add 5 pounds of wettable sulfur for rust mite control.

Growers are sometimes disturbed when a heavy rain falls on a grove just after it has been sprayed. Experiments have shown that rain, even one or two hours after a thorough application of either oil emulsion or parathion may slightly reduce scale control, but not enough to make re-spraying necessary. On the other hand, if sprays are not thoroughly applied, such a rain may seriously reduce scale control. Always put on a good thorough spray and rain won't hurt.

Growers should check for rust mite however, at frequent intervals whenever rains have fallen within 24 hours after a spray because the period of rust mite control may be reduced as much as 30 days by rain.

Except in dry locations, purple mites are not expected to be a serious August problem. If they become numerous and control is desired, aramite at 2 pounds per 100 gallons may be used. Ovex is also recommended, but only where this material has not been previously used during the year.

For more detailed information, refer to the 1954 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

*Written July 23, 1954. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and T. B. Hallam, Lake Alfred.

Insects On Lychee

Digest of Paper Presented At The
Citrus Institute Meeting, Lake Placid,
June 3, 1954, By G. W. Dekle, Entomologist,
State Plant Board Of Florida

The Lychee Growers Association has stimulated interest in commercial planting of lychees in Florida. As the acreage increases, we may expect additional insect problems, particularly where the trees are planted in groves or blocks. A list of insects infesting lychee has been compiled from the records of the State Plant Board and groves located in the State. The first Plant Board records date back to 1938.

Sixteen scale-insects have been found on lychee; however, only two are of major importance, but any one of the other may at some time present an economic problem. The most important scale-insect is an armored scale which does not have an accepted common name, but has been identified by Mr. G. B. Merrill, Chief Entomologist of the State Plant Board as *Pseudaulacaspis major* (Ckll.). The second is a soft scale and is known as Green Shield Scale

(*Pulvinaria psidii* Mask.). Both of these scale-insects are found on the bark and fruit. Once they move to the fruit, it is a total loss commercially.

A number of mites have been collected on lychee. The Avocado red mite (*Paratetranychus yotheri* (MaG.)), is the only one that has been definitely identified.

Three species of thrips have been collected from lychee. The red-banded thrips (*Selenothrips rubrocinctus* (Giard)), Florida flower thrips *Frankliniella bispinosa* (Morg.), and greenhouse thrips (*Heliethrips haemorrhoidalis* (Douche)).

Dr. D. O. Wolfenbarger, Entomologist of the Sub-Tropical Experiment Station, Homestead, reports three species of plant bugs found on lychee. The Southern green stink-bug (*Nezara viridula* (L.)), a coried bug *Euthochtha galeator* (Fab.), and the spined soldier bug (*Podisus maculiventris*

(Say)). The green stink-bug could be quite injurious to the fruit. Just how serious the coreid bug might be is not known, and the spined soldier bug is a predacious form, and Dr. P. Gray Butcher, of the University of Miami, considers it at present as being a beneficial form.

The American bird grasshopper (*Schistocerca americana* (Drury)), the restless bush cricket (*Haplinia agitata* Uhler)), and one of the katydids (*Microcentrum* sp.) have been observed feeding on the foliage of lychee. At times these may be of economic importance and control measures become necessary.

The lepidopterous larva have been found in damaging numbers feeding on lychee. One is a leaf roller and fruit scarring worm (*Platyedra stultana* Wism.), and the other one is a basket worm, one of the geometrids.

Florida Caverns Golf Course at Marianna, Florida, is the only State owned and State-operated golf course in Florida.

All forms of wildlife and plants are protected in Florida's State Parks.

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The Citrus Industry

EXCLUSIVE SPECIALIZED CITRUS
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Representing no special interest

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Effect Of Cross Pollination On Fruit Setting In Washington Navel Orange

A. L. EL-TOMI
COLLEGE OF AGRICULTURE
SHEBIN EL-KOM, EGYPT

The Washington navel orange was introduced into Egypt from the United States in 1902, but was not propagated and distributed until 1911, when some improved strains were imported and grown commercially in spite of the extensive demand for its fruit, growers have been discouraged by its scanty yield. The poor setting of this variety has been mentioned as the main obstacle to additional plantings in the Delta of the River Nile.

The goal of this study was to evaluate the significance of cross pollination in improving the setting of fruit in Washington navel orange.

Experimental Plan and Methods

During the fruit season, preliminary study was made of the influence on fruit setting of pollination with 12 different kinds of citrus pollen: Egyptian lime, Ruby orange, Sukkari orange, Tunisy orange, Common sweet orange, Florida Rough lemon, Sweet lemon, Sour orange, Duncan grapefruit, Gizawi shaddock, Eureka lemon, and Egyptian mandarine.

(1) The author is thankful to Prof. M. S. Ahmed and Prof. A. Helmy, Hort. Dept. University of Cairo, for their guidance and supervision of this research. He is also thankful to Dr. H. S. Wolfe, Head Prof. of Hort., University of Fla., for his editing this article.

The second season, 1949, was utilized to obtain more extensive information concerning the cross pollination effect of the six most promising varieties on the setting of Washington fruit. Thirty 17-year-old Washington navel orange trees, budded on sour orange rootstock, were selected at random. The trees were divided into six groups of five trees each to study the effect of the six pollinating varieties. From each pollinator to be tested, a tree was selected which seemed representative of that variety. All the trees involved

in the experiment were located at Shebin El-Kom, Egypt, in a well drained, clay loam soil of the Delta. The trees all received the same treatment so far as irrigation, cultivation, and fertilizer were concerned. Two applications of calcium nitrate fertilizer were applied, in early spring and in late fall, at the rate of three pounds per tree in each application.

The procedure of selecting the flowers and the inflorescences for both the pollination tests and the controls; together with the technique of pollination and the system of recording were generally in accordance with the procedure first suggested by Hume (2), and later by Frost (1).

Pollination tests were continued almost throughout the blooming period of the Washington trees with the

Table 1. Fruit set of Washington navel orange in 1948 pollination tests.

Parent	Date of Pollination (1)	Pollination			Control			Sig. Diff.
		Flo. Num.	Num. of set	Set. per.	Flo. Num.	Num. of set	Set. per.	
Egyptian Lime	3/17, 19, 31	981	11	1.12	581	45	7.75	
Ruby Orange	3/31, 4/1, 2	1071	177	16.53	451	114	25.28	
Common Orange	4/1, 2, 4, 5, 6	1948	211	10.83	682	148	21.70	
Sukkari Orange	4/8, 9 (2)	1305	403	30.88	199	61	30.65	
Tunisy Orange	4/10, 11	731	238	32.56	241	91	37.76	
Sour Orange	4/13	372	166	44.62	97	36	37.11	
Eureka Lemon	4/14	490	111	22.65	80	22	27.50	
Shaddock	4/15	472	214	45.34	56	17	30.36	*
Grapefruit	4/16	290	154	53.10	35	25	71.45	
Sweet Lemon	4/17	212	72	33.96	37	14	37.84	
Rough Lemon	4/18	279	56	20.07	47	14	29.79	*
Mandarine	4/19	157	53	33.76	24	10	41.67	
Total		8308	1866	22.46	2530	597	23.60	

(1) The Washington navel blooming period extended from 3/12 through 4/19.

(2) Full bloom extended from 4/7 through 4/11.

* Statistically significant at 5 per cent level.

six used pollinators. Because of the generally wide, well known variability of fruit set in the different branches of a citrus tree, both pollination and control tests were scattered around the periphery of the trees. The date for both seasons, 1948 and 1949, were analyzed by the "t" test while the effect of date on fruit set, in 1949, was analyzed too by the "F" test.

Results and Discussion

A. The results of the 1948 tests, using 12 pollen parents are given in Table 1.

From the data obtained in the preliminary tests conducted in 1948,

agreement with Webber's conclusions (4).

It is also evident that the fruit set was low at the beginning of the blooming period and increased slowly until at full-bloom it increased abruptly and continued high to the end of the bloom. The first flush was mostly composed of leafless inflorescences, with a few leafy ones, while the pattern of the full and late bloom inflorescences was the opposite. Reece (3) states that leafy inflorescences are characterized by a relatively higher fruit set than the leafless ones. It is believed that the relative numbers of these two types

Table 2. Mean fruit-set percentage of Washington navel orange pollinated by different varieties of citrus in 1949.

Parent	Date of Pollination (1)	Mean Fruit - Set Percentage		
		Cross Pollination	Controls	Significant Differences (3)
Sukkari Orange	4/1	00.00	4.30	
	4/2	0.24	0.44	
	4/8	5.15	2.89	
	4/16	89.46	64.41	** for dates
Common Orange	4/3	0.28	2.75	
	4/4	0.50	1.33	
	4/5	1.77	1.16	
	4/15	88.72	67.32	** for dates
Sour Orange	4/16	88.59	92.83	
	4/9	4.00	1.72	
	4/17	65.67	77.16	** for dates
Sweet Lemon	4/10	21.05	8.72	
	4/13 (2)	55.78	85.35	
	4/19	96.11	85.43	** for dates
Grapefruit	4/14	86.76	89.37	
	4/20	97.42	94.17	** for dates
Shaddock	4/20	87.89	85.66	
	4/21	84.02	82.77	
	4/22	93.42	97.06	
	4/23	93.29	93.39	* for dates
	4/24	95.20	94.90	

(1) The blooming period extended from 3/25 through 4/24.

(2) Full bloom period extended from 4/11 through 4/17.

(3) No significant differences between treatments.

* Statistically significant at 5 per cent level.

** Statistically significant at 1 per cent level.

it is evident that cross pollination did not increase the fruit set of the Washington navel orange in the case of any pollen parents except the Shaddock and the Florida Rough Lemon. Shaddock pollen gave significantly greater fruit set than the controls, while Rough lemon gave significantly less. However, the number of flowers involved in both cases was not large. Moreover, only pollination on one day was done in both cases, and the controls were not large enough to give a fair comparison with the treatments.

Generally, the fruit set percentage was low at the beginning of the season and increased during the full and the late bloom in both tests.

B. The results of the 1949 tests with more extensive study of only 6 pollinators, are given in Table 2.

From the data obtained in 1949, it is evident that the cross pollination failed to increase the fruit set of the Washington navel orange in all tested parents. This result is in

of inflorescence are chiefly responsible for the very wide variability between tests in the early and the late parts of the bloom period.

Selected Literature

1. Frost, H. B. 1942. Control of pollination. Citrus Industry Volume I: 905 — 906 University of Calif. Press. 1948.
2. Hume, H. H. 1926. The cultivation of citrus fruits. pp. 145 — 148 The Macmillan Co., New York.
3. Reece, R. C. 1945. Fruit set in relation to bloom type. Citrus Leaves 25 (Dec.) 26 — 27.
4. Webber, H. T. 1930. Influence of pollination on set of fruit in citrus. Calif. Citrog. 15: 304, 322 — 323.

Florida Caverns, Marianna, Florida, features gorgeously colored formations and amazing underground trails.

Stalactite formations at Florida Caverns, Marianna, Florida, look like myriads of soda straws.

Vaccine Power May Be Aided By Material In Citrus Peel . . .

A substance derived from a material occurring in citrus fruit peel may have possibilities for increasing the power and prolonging the effect of certain vaccines, a Philadelphia scientist reported today.

Dr. Jack Moss of the National Drug Co., research laboratories, said the substance is a phosphorus-containing compound based on "hesperidin"—a material found in citrus fruit peel.

He told the Society of American Bacteriologists he had employed it in laboratory tests, in conjunction with vaccines against typhoid fever, whooping cough and one form of influenza. And he said there were indications that it enhanced the effect of the vaccines from the standpoint of potency and of duration of immunizing power.

The researcher added there also are more tentative indications of a similar possible effect on materials designed to produce immunity against lockjaw, diphtheria and one form of polio.

Another doctor at the meeting told a reporter he had tried the same hesperidin compound in conjunction with the influenza vaccine mentioned by Dr. Moss, but had been unable to find any significant effect.

Dr. Moss said trial of the material as a possible "adjuvant" or aid to a vaccine was based on this concept.

The hesperidin compound has long been known to be capable of inhibiting the action of hyaluronidase, a chemical which normally aids the passage of materials through connective tissues of the body.

Thus, he said, the hesperidin appears to slow up the absorption of a vaccine from the site of the injection and to set up a so-called "depot" mechanism that prolongs the vaccine's effect.

Appointment of a home demonstration agent, an assistant and a neighborhood demonstration agent are announced by Director H. G. Clayton and State Home Demonstration Agent Anna M. Sikes of the Agricultural Extension Service. Director Clayton also announces the appointment of Harold Moreland, R.J., as assistant editor of the Extension Service and Experiment Station.

21st Annual Citrus Growers Institute, Camp McQuarrie, Aug. 16-20

All roads lead to Camp McQuarrie and the 21st Annual Citrus Growers Institute Monday to Friday, August 16-20. One of the finest programs in the Institute's history will be presented at this popular citrus meeting for growers and their families. The Institute is conducted each year as a short course in citrus production and marketing problems by the Florida Agricultural Extension Service. In addition to a fine educational program, a good program of recreation has been developed.

Camp McQuarrie, a Florida 4-H Club Camp, is located near Astor Park in northern Lake County in the Ocala National Forest. The campsite is on a beautiful clear, fresh water lake. There are 10 cabins at the camp each of which will provide sleeping accommodations for 12 persons. Certain cottages are assigned to men and other to women. Children are welcome to come to the Institute with their parents and enjoy the fishing, boating, swimming, horse shoe pitching and other recreational features at the camp.

There is no charge for sleeping facilities at the camp as long as they last. Visitors must furnish their own sheets, pillows, towels and other personal effects. Reservations will be made for those who wish to stay one or more nights on the basis of "first come-first served". Write for reservations to R. E. Norris, County Agent and Citrus Institute Manager, Travares, Florida. There is a \$1.00 reservation fee which is credited on meals after visitors arrive at the camp. Additional sleeping facilities are available at nearby motels. All meals are served at the camp from supper Monday thru breakfast Friday at the nominal price of \$9.00 per person. Individual meals are \$1.00, except breakfast, 65 cents.

Top notch citrus people of state and National reputation will be on the program. Growers are invited to attend the Institute for any one or for all of the sessions.

The complete program follows:

OFFICIAL PROGRAM

21st Annual Citrus Growers Institute
Camp McQuarrie, Lake County,
Florida

Monday Through Friday,
August 16-20, 1954

Monday, August 16

R. E. Norris, in Charge
2:00-6:00 p. m. — Camp registration.
6:15 — Supper, Mess Hall.
8:00 — Assembly, Auditorium.

Tuesday, August 17

K. S. McMullen, Extension Service
District Agent, in Charge
7:15 — Breakfast, Mess Hall.
8:30 — Announcements, Auditorium.
F. S. Perry, Extension Service
District Agent, Presiding
8:45 — Invocation, Rev. Lee W. Davidson, Pastor, First Methodist Church, Umatilla.



S. R. SMITH
Fruit and Vegetable Division,
Marketing Services, U. S.
Dept. of Agriculture

Welcome, Karl Lehmann, Secretary
Lake County Chamber of Commerce.

Opening Remarks, H. G. Clayton,
Director, Florida Agricultural Ex-
tension Service, Gainesville.

"Top-Working Bearing Citrus Trees"
Fred P. Lawrence, Citriculturist, Ag-
ricultural Extension Service, Gaines-
ville.

Intermission

"A Discussion of Greasy Spot"
W. L. Thompson, Entomologist, Citrus
Experiment Station, Lake Alfred.

"Seasonal Changes in Florida
Temple Oranges" Dr. Paul L. Harding,
Principal Plant Physiologist, U. S.
Department of Agriculture, Orlando.

12:15 — Dinner, Mess Hall.

W. J. Platt, Jr., Extension Service
District Agent, Presiding

1:30 — "The Value of the Citrus
Commission to the Florida Citrus
Industry." J. J. Parrish, Jr., Titus-
ville, Chairman Florida Citrus Com-
mission.

"Arsenic on Grapefruit" Dr. E. J.
Deszyck, Assoc. Horticulturist, Citrus
Experiment Station.

Intermission

"The State Plant Board's Program
in Relation to the Citrus Industry".
Ed L. Ayers, Plant Commissioner,
State Plant Board of Florida.

"The Importance and Need of Citrus
Breeding Work" Dr. P. C. Reese,
Botanist, USDA, Orlando.

4:00 — Adjourn, Swimming, Boating,
Fishing, etc.

6:15 — Supper, Mess Hall.

8:00 — Auditorium, Evening Enter-
tainment.

Wednesday, August 18

K. S. McMullen in Charge

7:15 — Breakfast, Mess Hall.

8:30 — Announcements, Auditorium.

M. O. Watkins, Asst. Director,
Agricultural Extension Service,
Presiding

8:45 — "Developments in Tristeza
Research", Dr. T. J. Grant, Plant
Pathologist, USDA, Orlando.

Practical Application of A Biological
Citrus Insect Control Program: Lail
Morthland, Grower, Weirsdale

Intermission

"Present Status of Research on
Spreading Decline" — Dr. R. F.
Suit, Plant Pathologist, Citrus Ex-
periment Station.

"Methods of Treating Spreading
Decline in Citrus" — Morton Howell,
Production Manager, Waverly Growers
Cooperative, Waverly.

12:15 — Dinner, Mess Hall.

1:30 — "With Quantity — What
About Quality." S. R. Smith, Fruit
and Vegetable Division, Marketing
Service, US Department of Agricul-
ture, Washington.

"Trends in Citrus Processing in
Florida"—Dr. F. W. Wenzel, Chemist,
Citrus Experiment Station, Lake Al-
fred.

Intermission

"Notes on the Life of the Citrus
Tree Snail" — Dr. M. H. Muma, As-
sociate Entomologist, Citrus Experi-
ment Station, Lake Alfred.

(Continued on page 13)

Florida Citrus Budwood Certification Program

The need for budwood free from all bud-transmitted diseases or bud propagated disorders has long been recognized and discussed by leaders of the citrus industry and professional people connected with the industry. Following World War II, Florida's citrus acreage expanded beyond all expectations and the need for healthy nursery trees was brought into sharp focus. Research people were able to give us new information on old maladies that had plagued our industry. Several of the diseases that had been labeled with the old horticultural stand-by of incompatibility were proved to be bud-transmitted various diseases. Our increased knowledge pointed out the need for certified disease-free citrus budwood and influenced for-sighted individuals to start working toward such a program for Florida.

This thinking culminated in a symposium presented to growers at their eighteenth annual citrus institute at Camp McQuarrie in August, 1951. Mr. Fred Lawrence, Citriculturist for the Agricultural Extension Service, served as moderator. Dr. J. F. L. Childs, Pathologist, U. S. D. A. Sub-Orlando, presented a paper describing those diseases known to be bud transmitted. Dr. R. F. Suit, Pathologist, Citrus Experiment Station, Lake Alfred, presented a paper giving some of the economic losses growers were receiving from these diseases. Mr. W. F. Ward, Ward Nurseries, Avon Park, presented a paper giving the views of the nurserymen on a certification program. Mr. W. W. Lawless, grower, Winter Haven, presented the viewpoint of the grower and production manager on the subject. Mr. Arthur C. Brown, Plant Commissioner (now retired) of the State Plant Board, summarized the regulations and procedures followed in the California program established in 1938 and in the Texas program established in 1948. Following these talks, the growers participating in this institute passed a resolution favoring the formation of a budwood certification program for Florida.

The Florida State Horticultural Society, at their sixty-fourth annual meeting in October, 1951, had Mr. Carl Walbel, Assistant Chief, Plant Quarantine Division, Texas Department of Agriculture, explain the Texas

JOE N. BUSBY

Assistant Chief Plant Inspector At
Lake Placid Citrus Institute

program to the citrus section of the passed society. The Horticultural passed a resolution asking for the immediate institution of a program for certifying citrus nursery stock free from bud-transmissible diseases. This resolution requested the State Plant Board, Florida Agricultural Experiment Station, the U. S. D. A.



JOE N. BUSBY

Subtropical Fruit Experiment Station at Orlando, the citrus nurserymen, and the Florida Agricultural Extension Service to cooperate in the formulation of a plan suitable to the need of the Florida citrus industry and to make this plan available as soon as possible. The Horticultural Society also appointed a standing committee to co-operate with the above-named agencies, Florida citrus growers, and other interested persons in the formulation of this program. This resolution also requested the State Plant Board to accept the responsibility for directing and administering this program.

The above-named committee and representatives of co-operating agencies worked out the details of the Florida Citrus Budwood Certification Program. This committee took advantage of mistakes made by California and Texas and designed a certification program that should prove to be a credit to the world's largest citrus industry. The members of this committee worked diligently to prepare this program and should be commended by the industry for their efforts.

By November, 1952, the Florida Citrus Budwood Certification Program was completed and the State Plant Board had accepted the job of administering the program. The program for Florida is flexible so that it can be changed to meet the needs of the industry and keep abreast of new research information. The committee appointed by the State Horticultural Society and representatives of the co-operating agencies remained as a permanent advisory committee to the State Plant Board for the Citrus Budwood Certification Program. On November 12, 1952, the State Budget Commission released \$12,000 to the State Plant Board at the request of this advisory committee. This money was used to start the Citrus Budwood Certification Program now in effect. This program was designed to be entirely voluntary on the part of nurserymen and response to the program since its inception has been most gratifying.

In the spring of 1953, eighteen citrus nurseries entered 309 prospective parent trees in the program. This past spring 18 additional nurseries entered 269 prospective parent trees. In the late spring of this year four Dade County nurseries requested help in locating 80 Tahiti-type limes to place under test. Plant Board inspectors are presently trying to locate limes that will meet the requirements for certification. The State Plant Board has established a nursery near Winter Haven to test prospective parent trees. In addition, greenhouse facilities in Gainesville and the personnel available for inspections are operating at full capacity. It should be of interest to you, as growers, to know that we have the following pres-

pective trees and varieties under test:

VARIETY	NUMBER
Valencia	189
Pineapple	90
Persian Lime	82
Hamlin	49
Marsh Seedless	41
Marsh Pink & Thompson Pink	40
Temple	36
Ruby Red	30
Duncan	18
Parson Brown	14
Tangerine	12
Pope Summer	10
Orlando Tangelo (Lake)	10
Navel	9
Lee Gim Gong	8
Sweet Seedling	4
Mediterranean Sweet	4
Jaffa	3
Foster Pink	2
Mc Carty	2
Marcott (Smith Late Tangerine)	1
Minneola Tangelo	1
Calamondin	1
Limequat	1
Bearss Lime	1
TOTAL	658

The foregoing trees are well distributed over the citrus-producing areas of the State. Following is a list of counties and the prospective parent trees in the county:

COUNTY	CANDIDATE TREES
Polk	242
Orange	81
Dade	80
Hillsborough	78
Indian River	47
Highlands	34
Lake	31
Pinellas	20
Volusia	15
Marion	13
Manatee	8
St. Lucie	5
Osceola	4
TOTAL	658

Five nurseries have budded 21,416 progeny trees that can be certified as free from psorosis in the spring of 1955 if psorosis has not become apparent by that time. The majority of these trees are being grown by large growers for their own use and will not reach commercial channels. It may be two or three years before certified nursery stock will be available in quantity. These trees will not be registered as free from xyloporosis and must remain under test four and seven years respectively before certification for these diseases can be made.

The growers in South Florida have exhibited considerable interest in limes and lemons this past year. Eighty-two Tahiti-type limes were

accepted by the State Plant Board for testing at the request of lime growers and nursermen. These trees are being tested for the diseases we know about, such as psorosis, xyloporosis, and tristeza, and we are making an effort to locate trees free from troubles peculiar to the lime. All lime trees entered will undergo a series of rigid inspections to weed out those trees exhibiting blotch in the leaves, bark disorders, and other undesirable characteristics that prove to be bud transmitted. Research agencies are co-operating with us to try to determine suitable methods of testing for the presence of those diseases peculiar to the lime. No promises can be made at this time as to what the results of these test may be. We do feel certain, however, that a number of lime trees will be located that will be better budwood sources whether or not they can meet the rigid requirements for certification.

Since the test nursery and much of the inspection work for budwood certification are near Winter Haven, the State Plant Board established a Budwood Certification Office in the Mayo Building, Winter Haven, in January, 1953. This office and the Budwood Certification Program were placed under Gerald G. Norman, Special Inspector, in charge. This office has proved to be quite convenient for growers and nurserymen participating in the program because of its central location in the citrus-producing areas of the State. Any person interested in registering a tree should write Mr. Norman at Post Office Box 41, Winter Haven, Florida.

Several growers and nurserymen have expressed doubt as to whether the Florida growers would pay the necessary price for trees registered in the Budwood Certification Program. Undoubtedly, nurserymen must receive some premium for trees carried through this program. We do not know as yet what the nurseryman's additional cost will be. Mr. Waibel told us that the additional cost to the nurseryman for a certified tree in Texas was about 25 cents. A certified tree then sells for a premium of 50 to 75 cents. If trees can be produced in Florida at a comparable price differential, they will definitely be worth the additional cost. Research on the subject of production losses due to diseases indicate that a grower must continually replace these trees or be faced with an unprofitable operation. If the grower replaces these trees with nursery stock propagated from virus-infected buds,

he is then simply setting up a never-ending cycle of removal and replanting. Dr. E. W. Cake, Agricultural Extension Service Marketing Specialist, derived a formula that is quite simple and it gives you, as growers, a chance to easily compute your loss due to disease. Dr. Cake claims that a tree space is below production costs for about 7 1/2 years if the grower is prompt in making replacements. The grower can compute his loss of production by multiplying his per cent of annual tree loss by the years required to get a tree back in production. In other words, for each 1 per cent annual loss of trees, the grower suffers a 7 1/2 per cent loss of production. Failure to replace trees promptly will increase the time out of production for the tree space and will further reduce the productive capacity of the grove. With our present mechanized cultural practices, you, as growers, know that you continue to cultivate, fertilize, and spray idle tree spaces. As a result, idle tree spaces give a loss of production with practically no reduction in costs. Now, let us consider the case of the man who is planting a new grove. This past spring I inspected a 15-year old Hamlin orange block of just over 400 trees. The owner had lost 256 trees since the grove was 10 years old because of psorosis. Approximately 25 per cent of the remaining trees were showing leaf symptoms or early bark symptoms of this disease. I am sure that this grower would be glad to pay a premium for trees that would be free from psorosis. In fact, he wanted to know when and where he could get registered nursery stock. In another instance, a grower planted 350 Orlando tangelo trees. The trees were declining badly with xyloporosis (cachexia) by the time the trees reached 5 years of age. Today the grove is practically abandoned and there are 18 healthy trees in the block. There is no doubt in my mind that the demand will be heavy for Orlando tangelo trees registered as free from xyloporosis. It is my belief that the growers will be willing to pay a reasonable premium for registered citrus nursery stock and that they will get their moneys' worth.

In summarizing, let me re-emphasize a few points:

Participation in this program has been entirely voluntary on the part of the nurserymen and they should be commended highly for their splendid co-operation and entry into this program. Many of our large nurseries have spent a lot of time

(Continued on page 13)

Avocado Production On Florida Sands

This subject could be handled much better by Mr. W. F. Ward or by Mr. Ivey Futch than me. These men have had more to do with pioneering the industry in sand soils than others and they have been growing avocados long enough to be thoroughly conversant with the various problems confronting the avocado grower on sand soils.

The Sub-Tropical Station located near Homestead is charged with the task of working toward the solution of avocado production problems over the entire state, but has never been given sufficient financial support to extend its activities much beyond Dade County. Some tests have been made on sand soils with young trees to gain some knowledge about the establishment of young orchards on these soils and some surveys have been made on the prevalence of insects and diseases affecting avocados. At present a survey is underway by Dr. T. W. Young of the relationship of avocado decline and certain nematodes, especially the burrowing nematode and the meadow nematode. Inoculation experiments with these nematodes are being made by Dr. Young on young seedling avocados to determine their possible pathogenicity to the avocado. Aside from these exploratory tests and surveys, my remarks are based on observations and on the experience of growers with whom I have discussed avocado problems.

Distribution of Avocods in Florida

Approximately four-fifths of the avocados in Florida are produced in Dade County where about 9,000 acres are planted to this fruit. Of this acreage at least 1500 acres are non-bearing and not more than half is in full bearing. Current average production is about 400,000 bushels, but this can be expected to increase considerably and may well reach 1½ million bushels within a decade barring major disasters. Southern Dade County still has thousands of acres of potential avocado land, but real estate development is rapidly cutting into this acreage.

In Dade County it takes from five to eight years to develop an avocado grove to the point where it pays its way. A mature grove represents a

GEO. D. RUEHLE
Sub-Tropical Experiment Station,
Homestead, At Lake Placid
Citrus Institute

sizeable investment or about \$1200 per acre above the price of the raw land. Since the cost of the raw land has rapidly increased in recent years and is expected to continue to increase as population continues to grow, the increase in land values is expected to slow down new planting and may even halt it entirely within a few years.

The remainder of South Florida produces about one-fifth of the avocados in the state. Most of these are produced in Highland, Polk, Hillsborough, Pinellas, Martin, Lee and Manatee Counties. Scattered small commercial plantings are found in several other counties but most trees in these counties are in dooryard plantings. There is no doubt that avocados can be grown more extensively in the Ridge section and in other sandy areas where freedom from cold and favorable soil drainage conditions exist.

Selection of Site

Mature trees of the West Indian race are killed by temperatures of 24 F and injure considerable at 27, while many Guatemalan varieties are not killed above 21 and some very hardy Mexican varieties endure less than 18. Young trees are less tolerant of cold than mature trees and those in their first year cannot endure temperatures within six or seven degrees of what mature trees can stand.

Because of their sensitivity to cold it is highly important that adequate air drainage be provided for avocados. Only the best situated land is suitable for avocado culture, preferably a hillside with a lake at the bottom.

The avocado is very intolerant of standing water and cannot endure "wet feet" for more than a day or two at most. Consequently care must be taken to avoid planting in areas subject to standing water during the season of heavy rains.

The discovery at the Citrus Station

that the burrowing nematode infests avocado roots and apparently causes decline of the avocado as it does of citrus trees, makes it advisable to avoid sites for avocado where the soil is known to be infested by these microscopic eelworms. It would be unwise to plant avocados in soil where citrus trees affected with slow decline have been removed.

Land Preparation

Land for avocados should be thoroughly cleared of roots of native trees and otherwise prepared in the same manner as for citrus groves. Rots of oak and certain other native trees may harbor the mushroom root rot fungus which later may attack the root system of the avocado.

Varieties

The varieties that appear to be succeeding best in sand soils are Lula, Taylor, Booth-7, Booth-8, Avon and Tonnage. Hall, one of the newer varieties, should be satisfactory also. Nabal is a hardy, late, Guatemalan variety that produces well on the sands but is difficult to keep free of Cercospora spot and anthracnose. Since it requires more spraying to keep the fruit clean it is losing favor at present. Of these varieties, Lula, Taylor and Avon are of the "A" group for pollination. Booth-7 and 8, Hall, Nabal and Tonnage are of the "B" type. The value of interplanting A and B varieties is questionable at least in the case of some varieties such as Lula. With others it is probable that maximum yields cannot be expected from solid plantings. Where several varieties are planted in a grove it would seem advisable to interplant reciprocating varieties. In some seasons the presence of a reciprocating variety might be of no value but in others it might be of considerable importance.

Florida is in need of better varieties. None of our currently popular varieties is entirely satisfactory. There are thousands of seedling trees growing in dooryard plantings in the state. A few of these might prove to be desirable as commercial types and everyone interested in the avocado should be on the alert for such promising seedlings. No seedling should be considered for actual planting in a commercial way, however,

until progeny from the parent tree can be brought to bearing.

Rootstocks

We know little about rootstock for avocados particularly on sand soils. Little careful work has progressed far enough on this program to make very positive statements regarding the possible advantages of one over another.

In a test at Homestead trees of two varieties on Lula seedling understocks are more vigorous than trees of the same varieties on Waldin seedling understocks. The trees in the test are grown under similar cultural conditions. The whole question of rootstocks for avocado requires experimentation.

Spacing

Spacing of trees in the grove should be governed somewhat by the varieties planted and by the type of soil. Trees tend to grow larger in rich soil than in poor, and in deeper soil than in shallow. Some varieties grow tall and slender and other have a spreading habit. Some as Lula and Hall, are subject to scab, a fungus disease that is favored by close spacing in two ways. Close spacing tends to provide a more favorable microclimate for fungus and also makes it more difficult to thoroughly spray the foliage, a necessary measure for controlling the disease.

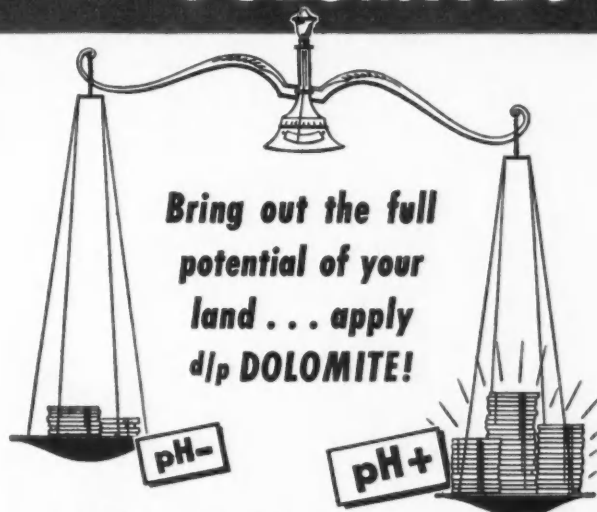
A spacing of 25 feet each way is at present the commonest planting distance in Dade County. This is too close for the Ridge section. A spacing of 30x30, 30x35, or 35x35 would be better for the sand soils. The scab-susceptible Lula should be given the wider spacing to allow better aeration and thus make conditions less favorable for the fungus and better for the spray crew. The Lula will grow very tall if the trees are spaced close together. It has been found to be next to impossible to control scab in the tops of these trees in Dade County and growers there have adopted the practice of topping these tall trees to 18-20 feet. Under close spacing conditions, the new growth in such topped trees again quickly shoots skyward. A better system would be to adopt wider spacing and train the trees by pruning to assume a more spreading habit. Even the Taylor tree can be made to spread when pruned properly if given sufficient room. In the Ridge, spacing of 17½ x 35 would be desirable if the grower was willing to remove the alternate trees when crowding in the closely spaced rows begins to occur.

Fertilization

There is little experiment data available to serve as a guide for fertilization practice on bearing avocado trees in sand soil. Fertilizer practices found to be desirable on citrus should if adopted for the avocado come fairly close to satisfying general requirements. Certain differences between avocados and citrus trees should be taken into consideration. The feeder roots of an avocado tree are nearly all within the top foot of soil so that leaching of soluble nitrates may be of more concern on the avocado than on citrus with its

deeper feeding root system. It has been evident in some avocado groves no sand soils that the trees have benefited by enriching the surface layer of soil by the liberal use of such organic fertilizers as tobacco stems and poultry manure. The periods in the year when bearing avocado tree should have an abundant supply of nitrogen are just after the crop has set and at harvest. There is evidence in Dade County that supplying nitrogen through foliage sprays just before and during the normal "June drop" period will result in a larger crop. A large crop

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carried to maturity will so deplete the tree that in many varieties a full year's rest is necessary before that tree will again bear a crop. Supplying additional nitrogen to stimulate new growth as the crop is removed will aid the tree to recover. Apparently with the avocado as with many other fruit trees, nitrogen feeding should be heavy during the "on fruit" years and relatively lighter during the "off fruit" years.

In Dade County we find it necessary to apply fertilizer from three to six times per year. Usually this program involves the application of complete mixtures three or four times supplemented by one or two applications of a straight nitrogen source. I am sure that such frequent applications will not be necessary to bearing trees in the deeper sand soils. It may be that two applications will supply the needs of the trees in the sands. For complete mixtures in Dade County we are now favoring 7-2-6-3 or 6-2-6-2 mixes. The trend is to still higher amounts of nitrogen in the mixtures and to the use of more slowly available forms of chemical nitrogen.

We are also supplying zinc at least once a year with one of the fungicidal sprays and are beginning to think that boron is beneficial in small amounts. A brown seed condition in Booth-8's appears to be corrected by supplying boron. This element is supplied either with the fertilizer or with one of the fungicidal sprays. These elements probably should be supplied also on the sands.

The fertilization of non-bearing trees is another matter. The aim here is to grow a tree fairly rapidly and it is thought that practices found to be sound in Dade County should give good results in the sands. Mulching the soil about each tree and keeping the middles either clean cultivated or closely mowed is desirable. Frequent light applications of a well balanced grower-type fertilizer with the supplying of sufficient water during dry periods to keep growth active during spring, summer and fall has given the best results. Mixtures such as 5-7-5-3, 5-5-5-3 or 4-9-3-1½ have given good results in Dade County and on sands in exploratory tests. Care should be taken to make light applications evenly distributed over the root area. Young avocado trees have been killed by over fertilization or by careless distribution of readily soluble chemical fertilizers. Applications should start at about one-fourth pound per tree and should never exceed one-pound

up to the end of the first year and these may be spaced one to two months apart depending on the occurrence of leaching rains. The application of a mild nutritional spray containing copper, zinc, manganese and boron misted onto the leaves is a good safe practice once or twice a year during the first two years and once a year thereafter until the trees reach bearing age.

Mulching heavy enough to keep the ground cool and moist, and to suppress weeds is a valuable practice to keep the trees in a healthy vigorous condition. When cold weather is expected, this mulch can be pulled away and the trees banked with sand, or the mulch can be augmented with straw and the trunks tied up with the straw to protect the bud and trunk from cold.

Diseases and Insects

Cercospora spot is the commonest disease of the avocado in Florida, no commercial variety being immune to it. It attacks both foliage and fruit and the fruit infections furnish one of the common avenues of entrance for anthracnose which causes a soft rot of the mature fruit. Control is effected by the use of copper fungicides. An application in early May followed by another in early June gives effective control on

varieties maturing in summer and fall. Both foliage and fruit should be well covered by these sprays. On winter maturing varieties, a third spray application in early to mid-July is desirable, directed chiefly to covering the fruit. Wettable cuprocide at one pound to 100 gallons, bordeaux mixture 4-4-100, or tribasic copper sulfate at three pounds to 100 gallons will give effective control if thoroughly applied with a spreader.

Avocado scab is a very serious disease of the Lula and Hall varieties and occasionally will attack Taylor, Nabal and other varieties. It is favored by moisture and by over crowding of the trees. It carries over from one season to the next on old foliage and control must start as soon as new growth appears in the spring. Infection is possible only on young expanding tissues. Control on the Lula starts with a fairly strong copper fungicide (wettable cuprocide 1½ pounds to 100 gallons, or bordeaux mixture 6-6-100 with spreader added) applied (1) just as the bloom buds open; (2) near the end of the main bloom period; and (3) three to four weeks after (2). The spray schedule for Cercospora spot control usually controls scab



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satisfactorily on moderately susceptible varieties.

Minor fungus troubles such as powdery mildew and red alga spot are usually of no consequence on trees sprayed for Cercospora spot or scab.

We know too little about the decline disease caused by nematodes to say very much about it at present. Control probably will be difficult and costly. Root rot caused by the cinnamon fungus is present on the lower east coast where avocados are planted on marginal land for flooding. Similar troubles have not been studied sufficiently in the sand soils to make us sure of our ground regarding causative factors and control.

Scale insects, especially Dictyospermum and pyriform scales often become troublesome on the avocado. They are controlled by the use of oil emulsions or by parathion. The avocado red mite often requires control in the fall and winter. Spraying with wettable sulfur or dusting with sulfur will effect control if applied when these pests appear. Other pests sometimes appearing in damaging numbers include mirids, leaf roller, thrips, whitefly, ambrosia beetles, a leaf tier and a tree-girdler. These pests can be controlled by sprays of the common insecticides. The tree girdler is perhaps controlled best by going over the trees periodically and removing the larvae by hand.

Pruning

Little pruning is done on the avocado except for the shaping of the top on young trees and of topping or removal of dead or interfering branches on older trees.

Irrigation

There is no conclusive evidence that irrigation of bearing avocado trees is either necessary or desirable in Dade County. Excellent crops are produced in some groves without irrigation. Some irrigation usually is necessary on young trees during dry periods. Just how much water to apply will depend on the soil structure, the efficiency of the mulch and the severity of the drought.

Cover Crops

There is also no conclusive evidence that a planted cover crop is valuable in Dade County. A grown cover quickly becomes established of grasses, native or escaped legumes and other weeds without doing any planting, and this apparently is as good as trying to establish a planted cover crop. In the sand soils, I think it might be of some advantage to establish hairy indigo or some other legume in the middles, but whether

21ST ANNUAL CITRUS GROWERS INSTITUTE, CAMP McQUARRIE, AUGUST 16TH THRU 20TH

(Continued from page 7)

"The Effect of Soil Type on Root Distribution" — Dr. Harry W. Ford, Asst. Horticulturist, Citrus Experiment Station, Lake Alfred.

4:00 Adjourn — Boating, Fishing, Swimming, etc.

6:15 Supper — Mess Hall.

8:00 Auditorium — Evening Entertainment.

Thursday, August 19

K. S. McMullen in Charge

7:15 — Breakfast, Mess Hall

8:30 — Announcements, Auditorium. Zach Savage, Assoc. Economist, Florida Agricultural Experiment Station, Presiding

8:45 — Tape Recorded Panel Discussion on Lemons and Limes in Florida.

"The Citrus Mite Problem", Dr. Herbert Spencer, Entomologist, USDA, Orlando.

Intermission

"Effects of Sulfur and Nitrogen on Subsoil Acidity in Florida Citrus Groves", Dr. I. W. Wander, Soil Chemist, Citrus Experiment Station. "Merchandising, Gimmick or Gold?"

Walter J. Page, Director of Public Relations and Merchandising, Florida Citrus Exchange, Tampa.

12:15 — Dinner, Mess Hall

1:30 — Louis W. Zeigler, Professor of Citriculture, Florida College of Agriculture, Presiding

"Florida Citrus Mutual," Robert W. Rutledge, Lakeland, General Mgr. Fertilizer Panel — "The New Citrus Fertilization Recommendations," Frank L. Holland, Manager, Florida Agricultural Research Institute, Moderator.

Panel Members: J. W. Whitaker, Swift & Co. Winter Haven, W. R. Hancock, Fosgate Growers Cooperative, Orlando, Dr. Herman Reitz, Citrus Experiment Station, Lake Alfred, Dr. Walter Reuther, U. S. Horticultural Laboratory, Orlando, Fred P. Lawrence, Agricultural Extension Service, Gainesville.

4:00 — Adjourn, Boating, Swimming, Fishing, etc.

6:15 — Supper, Mess Hall. Auditorium.

Friday, August 20

7:00 — Breakfast

Camp and Institute Adjourn.

There is a typical northern maple-beech forest at Florida Caverns State Park, Marianna, Florida.

this is the case or not will have to be determined by experimentation.

FLORIDA CITRUS BUDWOOD CERTIFICATION PROGRAM

(Continued from page 9)

and money to place prospective parent trees of the major commercial varieties under test. It has been most gratifying to the Plant Board to see many of these nurseries adopting the rigid inspection procedure used in the Budwood Certification Program for the selection of their commercial budwood. This should definitely result in longer-lived nursery stock of improved quality for the consumer.

Competition is making it absolutely necessary for the grower to operate efficiently if he plans to stay in business. One way to increase production and reduce costs is to keep all tree spaces in the grove producing. Replace the boarders and vacancies with healthy trees free from bud-transmitted diseases. Make all young plantings with trees that will hold replacements at a minimum during the years of peak production. In this country, there is the old saying, "You get what you pay for." These words will definitely apply to the grower who pays a premium to obtain certified citrus nursery stock.

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Citrus In School Lunches Corrects Vitamin C Deficiency

The seed for this highly promising activity was sown in Hardee, DeSoto, and Charlotte counties during the 1951-52 season when an experiment was begun under the direction of Dr. Robert E. Rice, Public Health Officer of those counties. The study by Dr. Rice was started after definite evidence of Vitamin C deficiency was discovered in the school children of that area. The Commission co-operated by assisting in getting the program underway and heard a report from Dr. Rice at its July, 1952, meeting that preliminary surveys indicated a 40 per cent improvement in the health condition of the children participating in the program.

Accordingly, at its September, 1952, meeting the Commission authorized the employment of Mrs. Helen Stewart, of Jacksonville, as director of a school education program, and set up a budget item of \$15,000 for its activities in the 1952-53 fiscal year.

The purpose of the program was to increase consumption of citrus products so as to keep pace with citrus production. The device used was the development of a sound long range educational health program that could be expected to win the endorsement and support of health, educational, and parental leaders throughout the state and, ultimately, the nation.

Mrs. Stewart, well known in Florida school and Parent-Teacher Association circles, embarked on a three-point program designed to: 1. Stimulate and coordinate the activities of key individuals and organizations interested in the increased use of citrus information and products; 2. Integrate supplementary teaching aids on the subject of citrus in the school curriculum; and 3. Create a situation in which the consumption of citrus becomes a definite part of each child's day.

The response from educational and health officials in the state was immediate and a State Advisory Committee was formed consisting of the State Supervisor of Home Economics; the Nutritionist, State Health Department; Head of the State Dental Bureau; Supervisor of State School Lunch Education; President of the Florida Con-

gress of Parents and Teachers; and representatives from the State Dietetics Association, the State Dental Association, the State Medical Association, and a representative of school principals in the state.

By working through the State Advisory Committee, the program was removed from the "frowned upon" category of advertising promotions and introduced as a highly respected program approved and recommended to the schools. All plans made by the committee were submitted to the State Department of Education and the State Board of Health before being introduced into the schools.

Twenty Florida schools were selected for voluntary pilot studies on the basis of geographic location, size and type of community, age and grade level of children. Eight of these pilot schools were primarily concerned with the medical and nutritional aspects of the program. Dental examinations were

made before introduction of the citrus juice program. The Florida Citrus Commission provided these schools with dispensers, paper cups, orange juice, and cup disposals for a ten weeks study. There were approximately 2,000 children involved.

All of the children received five ounces of orange juice daily. The children showing Vitamin C deficiency received ten ounces. Dental examinations were also made at the conclusion of the ten weeks time so that the outcome would be a basis for showing, statistically, the benefits to be derived from increased Vitamin C intake in the daily diet.

The other twelve pilot schools were concerned primarily with the physical and practical aspects of the program concerning themselves, mainly, with the problems of supply, storage, consumption, dispensing, labor, sanitation, cost, etc.

In schools where an educational program was conducted in conjunction with juice sales—the sales doubled or tripled. In two schools in the same city: the one in which there was no educational program sold five gallons per week—the

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Florida growers now consider magnesium a primary plant food in the same category with nitrogen, phosphorus and potash.

The recommendations of the Florida Citrus Experiment Station at Lake Alfred, published in January 1954, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

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one in which an educational program was conducted sold 120 gallons in a week. The latter school was the smallest school.

Purposes of the pilot studies were: 1. To evaluate current methods and develop new ways of serving citrus in the schools; 2. To evaluate the health status of children receiving citrus; 3. To introduce the program into the key counties of the State, giving each county its own personal experience with the program, thereby creating interest and friends for future program plans.

Good, educationally sound nutrition materials were needed for classroom use for all grade levels to familiarize the children with the importance of citrus in their daily diets. These children will in this way form food habits that will follow them throughout their lives. These materials were developed in cooperation with the State Department of Education and Florida State University. They will be presented to the State Courses of Study Committee for approval for use in the public schools.

While results of the medical and nutritional study have not as yet been made public, preliminary indications are that the percentage of improvement in the children receiving orange juice daily was highly satisfactory, and the Commission has been urged by medical and dental officials associated with the primary tests to continue a similar study in the 1953-54 season.

A resume of the activities of the school education program was presented to members of the Florida Canners Association in May and that organization later endorsed the objectives of the undertaking wholeheartedly.

The Commission feels that its school program is progressing well ahead of schedule. Already more than 200 Florida schools have indicated a desire to have a dispenser program operated for their students in the 1953-54 season. Information on the program has also reached other states and at least two have requested that an attempt be made to institute a similar educational and nutritional study in their school systems.

Visitors can tour through electrically lighted underground caves at Florida Caverns, Marianna, Florida.

Grapefruit Salad

A "Florida Sunshine Salad", made of canned or frozen grapefruit sections and cottage cheese, will be one of the features of National Dairy Month, being sponsored through the month of June by the cooperative effort of the American Dairy Association and the Florida Citrus Commission.

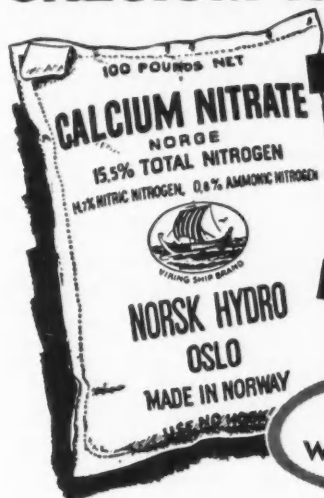
Store distributors and route salesmen working for 64 dairies in 28 states and the District of Columbia will put up more than 12,500 copies of a 14 by 22 inch poster showing the "Florida Sunshine Salad" in brilliant color, according to Frank

D. Arn, Merchandising Director for the Citrus Commission.

"We have had the wholehearted cooperation of the huge American Dairy Association in preparing for this promotion," Arn declared, "and we feel certain the combined effort will result in a substantial movement of Florida grapefruit sections."

Large and small dairies from such far distant points as Washington, Oregon, California, Colorado, New Mexico, and Nebraska, have written to the Citrus Commission requesting the display posters, Arn said, following a special message carried in the "Voice of the Dairy Farmer", a release made by the national dairy organization.

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EST. 1909

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The LYONIZER

COMPILED BY THE LYONS FERTILIZER COMPANY

Reports Of Our Field Men . . .

NORTH CENTRAL FLORIDA V. E. Bourland

We have been having hot weather, but the rains have been nice too. Groves are looking very good, and cover crops have grown mighty fast. Some growers are chopping theirs down now.

Fruit sizing up nicely and it looks now like we have plenty of all varieties. Growers are having to stay on the job watching the insects. Rust Mites are working most groves now. Weather conditions have been favorable for them. Young trees are looking good with their new growth but should be hoed or worked when cover crops are taking over. All ditches should be open so the water can get off before damage is done to trees. Pastures or the improved ones are looking good and the cattle doing fine.

HIGHLANDS AND POLK J. K. Enzor, Jr. & R. E. Lassiter, Jr.

Polk County by the middle of July in all areas has received sufficient amounts of rainfall. The new crop is sizing very rapidly with some grapefruit blocks already showing good sizes.

Most growers by this time have applied their Summer oil or parathion and the scale situation is much better than it was a month ago. Growers should be cautioned to check closely behind the scalecide for rust mite because large populations can build up rapidly this time of year. Young trees should be receiving their third application of fertilizer for the year at this time and the grower should be careful to see that it is raked or hoed in well. pH control is a very important part of good grove management and growers are strongly urged to see that these requirements are taken care of.

NORTH HILLSBOROUGH AND PINELLAS COUNTIES J. A. Hoffman

Most groves in this section put on a good flush of Summer growth. Fruit is sizing up and looks good at this time. Rains have been sufficient throughout this section so far. Even though the

light showers the temperature has been very high the past few weeks.

Rust mites have been a severe problem this Summer. It has been necessary to follow the Summer oil application within three weeks with a Sulphur spray to control the increasing infestations of Rust Mite.

During this period until Fall is a good time as any while things are slack to prune and hedge trees back if they are getting too close to work.

Summer applications of fertilizers are being applied to improved pasture grasses, such as Pangola and Pensacola Bahia. Large acreages of Alyce Clover has been planted for hay also in this section.

EAST HILLSBOROUGH, PASCO CITRUS & HERNANDO COUNTIES E. A. McCartney

Rain has been spotty in this territory. In most of this section we have had plenty of rain, but in north Pasco and South Hernando Counties some young groves are starting to need water badly. Groves are in good condition as a rule — young trees are being set out — mostly on lemon root oranges being the most popular. Some scale showing that has been taken care of with spray.

There is a good crop of fruit set — valencias and seeded grapefruit are a little light in some groves but over all there is a good crop.

Our summer application of fertilizer is over with the exception of young trees that will need attention in August and seed beds for the fall planting. The vegetable deal is, of course, over. Pasture grass is in good condition where there has been plenty of rain after the Spring fertilizer application.

SOUTH POLK, HIGHLANDS, HARDEE AND DE SOTO COUNTIES C. R. Wingfield

Over most of this area we have been without rains for three

days ending July 18th. This does not mean we are dry by any degree of thinking. We have had heavy rains most every day during the month up to the 16th, and in some localities it has been excessive. Perhaps some damage will show up in low areas.

Growers have completed their fertilizing in most cases except for young plantings, which are being fed regularly at 60 day intervals. The last feeding to come during the first week in September. Other activities after the oil program has been for the control of Rust Mite. If we have a few days of open weather it would be well to check for this insect and apply the control. If you should be one of those that will chop the cover crop at this time be sure to look for the Rust Mite after chopping is done. The fruit crop still looks good for early and midseason oranges, with Valencias below last year.

The vegetable grower is making preparation for the Fall crops at somewhat of a cut in acreage. It is too early to estimate how much is going to be planted.

SOUTHWEST FLORIDA Eaves Allison

This summer so far has been an old-fashioned Florida "rainy season", with daily afternoon rains over this whole area. There will be no dearth of moisture for the present citrus crop. Ponds, ditches and flatwoods are full, and by all the old signs and sayings we should have a mild winter in prospect.

Pasture grasses are responding well to the favorable moisture conditions. Newly established improved areas will gain much time in establishing a producing sod.

New land for vegetable crops is shaping up well, although some operations have been handicapped by the frequency of rain.

Citrus fertilization programs here should take into consideration a probable loss of available plant food from leaching. This condition may be corrected by an early August application of good Lyons Top Dresser or by a regular fall application early in October as conditions indicate.

ADVERTISEMENT — LYONS FERTILIZER COMPANY



Uncle Bill Says:

There's sich a thing as takin' too much for granted some times . . . 'n if you're interested in knowin' what caused this here comment it came as the result of a feller who has a citrus grove who gave the impression that his trees was doin' purty well so they didn't need the benefit of any special care, 'n certainly he didn't need no counsel from any expert to help him in case he had any production problems.

Most of us folks don't like to have other folks tellin' us how to run our business so we suspect somebody some time or other made the mistake of bein' too abrupt with this feller . . . they is folks like that, but most of the citrus production experts in Florida is folks that is willin' to help other citrus folks out if they are asked to do so . . . 'n while we bin in the business all our lives we're sort of glad every now and then when we run into a little trouble to call on somebody who has had the learnin' and the practical trainin' to help us out.

One thing is fer sure if our groves begin to develop trouble we don't know how to cure we sure ain't goin' to take it fer granted that the thing to do is to let 'em cure themselves . . . the Citrus Experiment Station and a lot of other citrus factors has gct the know how to help us if we need it, and we ain't goin' to fail to call on 'em.

One thing we don't need anybody to tell us is that the finest fruit will invariably bring the best prices . . . so that's our big purpose in raisin' citrus . . . to produce the biggest crops of the finest fruit we kin possibly raise.

And the one way we have found to do jist this thing is by usin' Lyons Fertilizers . . . they been doin' this sort of a job for us fer years and so far as we're concerned they're goin' to keep right on doin' it.

Hints To Housewives...

From
Home Demonstration Specialists
Tallahassee

GRAPEFRUIT SHORTCAKE

This recipe for grapefruit shortcake, given to her mother when she first came to Miami 29 years ago and submitted by Mrs. R. M. Welsh of Miami in the "eat more citrus recipe program," won first prize for the first week. The contest was sponsored by the State Home Demonstration Office of the Agricultural Extension Service and the Florida Chain Store Council.

Here is the winning recipe:

Grapefruit Shortcake

4 grapefruit
2 tablespoons sugar
Shortcake
2 cups flour
3 teaspoons baking powder
 $\frac{1}{2}$ teaspoon salt
 $\frac{1}{2}$ cup butter or margarine
1 cup milk
Sauce

3 cups grapefruit juice
1 tablespoon lemon juice
2 tablespoons flour or cornstarch
3 tablespoons butter
1 cup sugar
1 egg
1 teaspoon vanilla extract

Peel grapefruit. Separate sections carefully so as not to get in any of the pulp. Hold fruit over a bowl to keep juice. Break sections into little chunks, sprinkle with the two tablespoons sugar and set aside (not in cold place) till shortcake is made.

Shortcake: Mix flour, baking powder, salt and sift into a bowl. Add butter and chop it with a knife until mealy. Add cold milk. Stir to make a soft dough. Grease and flour an 8-inch round or square baking pan. Put in pan and press out with finger about 1 inch thick. Place in 425° oven for 10 minutes, then lower heat to 350° for 10 minutes longer or until brown.

Sauce: Mix cornstarch and sugar together. Add beaten egg yolk, grapefruit and lemon juice and butter. Cook, stirring often, until thickened. Add vanilla. Set aside until time to use.

Split shortcake and put part of the grapefruit sections in the center and part of the sauce. Put to-

gether and place the rest of the grapefruit and sauce over the top. Serve warm or cold. Garnish top with chopped cherries for color. Serves 6.

A new home demonstration club was organized in the Center Hill community recently under the direction of Mrs. May Fulton, Sumter County home agent.

Classified Ads

SUPERIOR CITRUS TREES — New booking orders for 100,000 trees for next season. Don't be caught short — place your order now. Some varieties still available for Summer planting. For quotations call us, 2-7541, or write —

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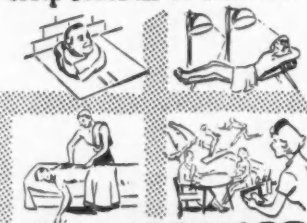
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- * excellent and maximum coverage!
- * its efficiency makes it economical!

BE SURE — INSIST ON THESE STAUFFER SULPHUR PRODUCTS!

LIQUID LIME SULPHUR SOLUTION an old Florida favorite for the control of rust mites on citrus, usually supplemented with wettable sulphur.

DUSTING SULPHUR a general purpose dusting sulphur largely used on citrus for the control of rust mites.

WETTABLE SULPHUR a product manufactured specially to meet Florida growers' requirements — for control of rust mites, may be used WITH or WITHOUT LIQUID LIME SULPHUR.

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in any bag!"

Florida Citrus Growers Administrative And Shippers Advisory Comm. Named

The appointment of eight members and their alternates to the Florida Citrus Growers Administrative Committee and to the Shippers Advisory Committee to serve under the amended marketing agreement and order program regulating the handling of oranges, grapefruit, and tangerines grown in Florida, was announced recently by the U. S. Department of Agriculture. The period covered by these appointments is Aug. 1, 1954-July 31, 1955. The Growers Administrative Committee, members and alternates respectively, include the following:

A. V. Saurman, Clearwater, and Robert H. Prine, Bradenton; Glenn L. Brown, Mt. Dora, and Chas. Z. Osborne, Umatilla; W. A. Prevatt, Seville, and Leslie T. Bryan, Altamonte Springs; Jack H. Ross, Oakland, and G. A. Seidel, Gotha; Robert S. Edsall, Vero Beach, and R. C. Bray, Titusville; Robert J. Barben, Avon Park, and John D. Terrell, Wauchoa; Sidney I. Smith, and A. G. Kingley, Winter Haven; George W. Bar, and Alfred M. Tilden, Winter Haven.

The Shippers Advisory Committee, members and alternates respectively, include the following:

Fred H. Johnson and Harry G. Gumprecht, Jr., Tampa; Howard Phil-

lips, Orlando, and Phil C. Peters, Winter Garden; W. G. Strickland, Vero Beach, and Robert K. Cooper, Florence Villa; Roscoe N. Skipper, Winter Haven, and Ben Hill Griffin, Jr., Avon Park; H. Y. Griffin, Auburndale, and J. Shelton Hearn, Lake Alfred; John R. Schirard, Jr., Sanford, and F. X. Heidrich, Orlando; Albin P. Crutchfield, Howey-in-the-Hills, and J. W. Bragin, Clearwater; James Heller, Winter Garden, and Cecil T. Cameron, Titusville.

The Shippers Advisory Committee makes appropriate recommendations, when advisable, to limit the shipment of certain grades and sizes of oranges, grapefruit, and tangerines, and passes them on the Growers Administrative Committee. The recommendation of the Shippers Advisory Committee, together with its own recommendation for limiting shipments, is transmitted by the Growers Administrative Committee to the Secretary of Agriculture. The Growers Administrative Committee also serves as the official administrative body under the amended marketing agreement and order program.

Ocala County's 2000 acres of soybeans are making good progress as a result of the recent showers. Most of the growers have good stands.

LAKE COUNTY CITRUS IN GOOD CONDITION

Most Lake County citrus groves are in good condition and making normal growth for this time of year except seedy grapefruit, which is slightly off, County Agent R. E. Norris reports.

Folks who attend summer citrus institutes get valuable information and advice, good food at cost, recreation, and entertainment.

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The production of citrus fruit in Florida has been on the upgrade for several years, but the increase in the prospective market has been increasing at the same time, which normally represents fair earnings for Florida growers.

This is particularly true with those growers whose products present a premium of Quality in the market, and accounts for the constant increase in the sale of Lyons Fertilizers, since

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